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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/737,397	12/15/2000	Yasuaki Tsuchiya	14162	8837
23389	7590	11/19/2003		
SCULLY SCOTT MURPHY & PRESSER, PC 400 GARDEN CITY PLAZA GARDEN CITY, NY 11530			EXAMINER GUERRERO, MARIA F	
			ART UNIT 2822	PAPER NUMBER

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/737,397

Applicant(s)

TSUCHIYA ET AL.

Examiner

Maria Guerrero

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,4,6,7,13-27,33,35,36 and 39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,4,6,7,13-27,33,35,36 and 39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This Office Action is in response to the Amendment filed August 25, 2003.

Claims 1-2, 5, 8-12, 23-32, 34, 37-38, 40 are canceled.

Claims 3-4, 6-7, 13-27, 33, 35-36, 39 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 3-4, 6-7, 13-27, 33, 35-36, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cadien et al. (U.S. 5,516,346) in view of Kaufman et al. (U.S. 6,063,306).

Cadien et al. teaches forming a concave in an insulating film formed on a substrate, forming a barrier layer, forming an interconnect metal film (copper or copper alloy) over the whole surface, polishing the surface by a first and second polishing processes until the surface of the insulating film other than the concave is exposed (Fig.4a-4c, col. 10, lines 5-20). Cadien et al. discloses using a polishing slurry comprising silica polishing material and an inorganic salt (fluoride salt) and an oxidizing agent (Abstract, col. 3, lines 1-5, col. 7, lines 1-10, 20-50, col. 8, lines 50-68).

Cadien et al. does not specifically show the polishing-rate ratio as claimed. However, Cadien et al. teaches controlling the etching rate of the barrier layer and the

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interconnect metal and controlling the etching rate of the interconnect metal and the insulating film (col. 7, lines 50-65, col. 8, lines 17-45, col. 9, lines 1-45).

Regarding claims 3-4, 6-7, 13-27, 33, 35-36, and 39, Cadien et al. fails to show the polishing slurry comprising an alkanolamine, a carboxylic acid, and benzotriazole. Cadien et al. fails to show the barrier film being a tantalum-containing metal film. However, Kaufman et al. shows applying a first slurry comprising an alkanolamine (such as, triethanolamine) and second slurry comprising carboxylic acid (such as, tartaric acid) in a polishing process as well known in the art. Kaufman et al. also teaches the slurry comprising benzotriazole and the barrier film being a tantalum-containing metal film (Abstract, col. 4, lines 15-67, col. 6, lines 2-45, col. 8, lines 20-45, col. 10, lines 50-65, TABLE 1, 4, col. 15, lines 25-65, col. 16, lines 48-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention to modify Cadien et al. reference by specifying the polishing rate as claimed and by including the specific compounds taught by Kaufman et al. in order to provide effective polishing at desired rates while minimizing surface imperfections and defects (Kaufman et al., col. 12, lines 10-15).

Response to Arguments

3. Applicant's arguments with respect to claims 3-4, 6-7, 13-27, 33, 35-36, and 39 have been considered but are moot in view of the new ground(s) of rejection.


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Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Guerrero whose telephone number is 703-305-0162.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Maria Guerrero
Patent Examiner
November 7, 2003